

I. AMENDMENTS TO THE CLAIMS:

Please cancel claim 7 without prejudice. Kindly amend claims 1, 3, 12 and 13, and add new claims 14-16 as follows.

The following claims will replace all prior versions of claims in the above-captioned application.

Listing of Claims:

1. (Currently Amended) An artificial bone forming method by a powder lamination method, comprising the steps of:

(a) forming a powder bone material having biocompatibility, and hardening by hydration, into a flat powder layer;

(b) jetting an aqueous solution having biocompatibility to a portion of the flat powder layer in order to harden by hydration the portion jetted by the aqueous solution; and

(c) repeating steps (a) and (b) in order to form, by lamination, a specified artificial bone of a predetermined three-dimensional structure in which the hardened portions are connected to each other; and

(d) after step (c), discharging a gas contained in the artificial bone to further reinforce the hardened portions by a reaction using a change in pressure.

2. (Previously Presented) The artificial bone forming method by the powder lamination method according to claim 1, wherein

the powder bone material includes an inorganic component, and

the aqueous solution is a liquid mixture, or a suspension of water and a water-soluble biopolymer, wherein the water-soluble biopolymer is a component derived from a living organism.

3. (Currently Amended) The artificial bone forming method by the powder lamination method according to claim 1, wherein the powder bone material is a ~~calcium salt~~ selected from the group consisting of calcium phosphate, hydroxyapatite, human bone, animal bone, alumina, collagen, polylactic acid, a copolymer of polylactic acid and polyglycolic acid, and a mixture thereof.

4. (Previously Presented) The artificial bone forming method by the powder lamination method according to claim 1, wherein the aqueous solution comprises a liquid mixture, or a suspension of water and a component selected from the group consisting of soluble collagen, proteoglycan, linkprotein, sodium tartrate, a pH adjuster, a bone growth factor, fibrin, Platelet-Rich Plasma (PRP), a polysaccharide, an amino acid polymer, polylactic acid, a copolymer of polylactic acid and polyglycolic acid, and a mixture thereof.

5. (Previously Presented) The artificial bone forming method by the powder lamination method according to claim 4, wherein the aqueous solution comprises two or more kinds of liquid mixtures that react with each other in a liquid layer to bring about a hardening reaction, wherein the two or more kinds of liquid mixtures are put in separate vessels and are jetted through a plurality of ink jet nozzles so as to be mixed and hardened at the portion jetted by the aqueous solution.

6. (Previously Presented) The artificial bone forming method by the powder lamination method according to claim 4, wherein a first component that further promotes a crosslinking reaction, or polymerization of a polymeric component of the artificial bone, is put in a first vessel different from a second vessel for living material to be reacted or

polymerized, and the first component is jetted through another ink jet nozzle in order to be mixed at an intended position.

7. (Cancelled)

8. (Previously Presented) The artificial bone forming method by the powder lamination method according to claim 1, wherein a hardening reaction is promoted for the formed artificial bone after step (d), or after step (c), directly under high-temperature and high-pressure water vapor or under a dry high temperature in an autoclave.

9. (Withdrawn) An artificial bone forming method by a powder lamination method, comprising:

carrying out a high-temperature heat treatment in a vacuum state or an oxygen-free atmosphere to induce a reaction between biopolymers of an artificial bone formed by mixing the biopolymers, a reaction with other components, or melting.

10. (Withdrawn) An artificial bone forming method by a powder lamination method, comprising:

a) a two-dimensional data creating step for sequentially moving a target bone in a predetermined direction to create two-dimensional data of a cut section,

b) a tissue data processing step for creating data to be subjected to rapid prototyping for a plurality of tissues constituting a bone from the two-dimensional data, and

c) an artificial bone forming step for forming an artificial bone constituted of a plurality of tissue structures by using a rapid prototyping device.

11. (Withdrawn) The artificial bone forming method by the powder lamination method according to claim 10, wherein the tissue data is constituted of a plurality of data selected from a cancellous bone, a bone trabecula, a lumen, and a cortical bone.

12. (Currently Amended) The artificial bone forming method by the powder lamination method according to ~~claim 2~~claim 7, wherein a hardening reaction is promoted for the formed artificial bone after step (d), or after step (c), directly under high-temperature and high-pressure water vapor or under a dry high temperature in an autoclave.

13. (Currently Amended) The artificial bone forming method by the powder lamination method according to claim 2, wherein the inorganic component of the powder bone material is selected from one or more of calcium phosphate, chondroitin sulfate, hyaluronic acid, collagen, pluteogulycan, glycosaminoglycan, deltaman sulfate, heparin sulfate and ketaran sulfate and other bone components.

14. (NEW) An artificial bone forming method by a powder lamination method, comprising the steps of:

(a) forming a powder bone material having biocompatibility, and hardening by hydration, into a flat powder layer;

(b) jetting an aqueous solution having biocompatibility to a portion of the flat powder layer in order to harden by hydration the portion jetted by the aqueous solution, wherein the aqueous solution comprises two or more kinds of liquid mixtures that react with each other in a liquid layer to bring about a hardening reaction, wherein the two or more kinds of liquid mixtures are put in separate vessels and are jetted through a plurality of ink jet nozzles so as to be mixed and hardened at a portion jetted by the aqueous solution; and

(c) repeating steps (a) and (b) in order to form, by lamination, a specified artificial bone of a predetermined three-dimensional structure in which the hardened portions are connected to each other.

15. (NEW) An artificial bone forming method by a powder lamination method, comprising the steps of:

(a) forming a powder bone material having biocompatibility, and hardening by hydration, into a flat powder layer;

(b) jetting an aqueous solution having biocompatibility to a portion of the flat powder layer in order to harden by hydration the portion jetted by the aqueous solution, wherein the aqueous solution comprises a liquid mixture, or a suspension of water and a component selected from the group consisting of soluble collagen, proteoglycan, linkprotein, sodium tartrate, a pH adjuster, a bone growth factor, fibrin, Platelet-Rich Plasma (PRP), a polysaccharide, an amino acid polymer, polylactic acid, a copolymer of polylactic acid and polyglycolic acid, and a mixture thereof; and

(c) repeating steps (a) and (b) in order to form, by lamination, a specified artificial bone of a predetermined three-dimensional structure in which the hardened portions are connected to each other,

wherein a first component that further promotes a crosslinking reaction, or polymerization of a polymeric component of the artificial bone, is put in a first vessel different from a second vessel for living material to be reacted or polymerized, and the first component is jetted through another ink jet nozzle in order to be mixed at an intended position.

16. (NEW) An artificial bone forming method by a powder lamination method, comprising the steps of:

- (a) forming a powder bone material having biocompatibility, and hardening by hydration, into a flat powder layer;
- (b) jetting an aqueous solution having biocompatibility to a portion of the flat powder layer in order to harden by hydration the portion jetted by the aqueous solution; and
- (c) repeating steps (a) and (b) in order to form, by lamination, a specified artificial bone of a predetermined three-dimensional structure in which the hardened portions are connected to each other, wherein a hardening reaction is promoted for the formed artificial bone after step (c), directly under high-temperature and high-pressure water vapor or under a dry high temperature in an autoclave.